Division of Water Resources

Guidance for Preparation of Coliform Sample Site Plans and Other Considerations for the Revised Total Coliform Rule

February 2015

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TN Division of Water Resources

Revised Total Coliform Rule Requirements

The Tennessee Department of Environment and Conservation, Division of Water Resources Revised Total Coliform Rule (RTCR) Regulations, Rule 0400-45-01-.41, become effective and applicable to all Public Water Systems on April 01, 2016. The rule requires bacteriological samples to be collected according to a written sample siting plan. To comply with the RTCR requirements, all Public Water Systems must develop new or revise existing sample siting plans to include the new requirements no later than March 31, 2016. The plans should be kept on site at the water system and be available for review. The plans are subject to review and revision during sanitary survey inspections conducted by TDEC-DWR staff.

Two circumstances exist which require a Public Water System to submit a revised sample siting plan to TDEC-DWR prior to implementation.

1) The system proposes to use alternative repeat sampling locations rather than the default location of within 5 service connection upstream and downstream of the original positive location. The public water system must submit sample site plan to the TDEC-DWR for review.

2) A seasonal system requests a reduction to quarterly monitoring, the public water system must provide justification of the period when monitoring will be conducted to include monitoring during the period of highest demand and or vulnerability to contamination. The public water system must submit the request for reduced monitoring and sample site plan to TDEC-DWR for review and approval.

Other significant RTCR changes pertinent to the bacteriological sample siting plans include;

1) All routine sampling site locations must be identified in the plan.
2) The rule allows for dedicated sampling locations / appurtenances.
3) The rule establishes assessment triggers, system responses and corrective action in lieu of a total coliform MCL.
4) All positive total coliform samples must be tested for E-coli.
5) All systems are required to collect three repeat samples following a positive bacteriological sample result.
6) A system on quarterly monitoring must collect three routine samples the month following a positive bacteriological sample.
7) All seasonal systems must demonstrate completion of a state approved start up procedure.
8) Line repair samples are considered special purpose samples and cannot be used for compliance with RTCR monitoring and compliance requirements.
9) Ground Water Rule dual purpose source samples are not allowed.

Plan Objective

The objective of the plan is to identify routine and repeat bacteriological sampling locations, to ensure that the correct numbers of bacteriological samples are collected each monitoring period at sites which are representative of water throughout the distribution system and to ensure public water systems take appropriate follow up actions in response to positive bacteriological samples.

General Plan Requirements

The plan should be written in such a way that it clearly identifies the number of samples required, the sampling locations, types of samples required, sampling procedures and actions required to be taken in the event of positive sample results. Sample siting plans must be reviewed periodically and updated as needed. A Public Water System should consider review and update of the plan when the customer population has increased sufficiently to require an increase in bacteriological samples, when source classification changes or when the addition of new infrastructure (i.e., wells, storage tanks, extensive distribution system lines, etc.) or major customer water use patterns significantly impacts the hydraulic flow of water in the system.

The plan should provide for community water systems to collect at least 30 % of samples from residential areas. Site considerations should include dead end lines, branch lines, low use areas, commercial areas near large storage tanks, areas of low water pressure and areas with elevated water age. The sample plan should ensure that no portion of the distribution system is neglected during the course of a year. For example, the distribution system can be divided into sectors or hydraulic zones and samples chosen from a variety of sample points in each sector. Sampling site locations should be justifiable from the standpoint that it helps the water purveyor understand the bacteriological quality of the water throughout the system and describes water quality consumed by all of the system's customers. The source(s) of water supplying sample sites should be identified for the purposes of conducting assessments and for compliance with source water sampling provisions of the Ground Water rule, if applicable.

The plan should include the RTCR assessment triggers and describe qualifications and timeframes for completion and submittal of reports. The plan should also include a listing of potential violations under the RTCR and provide example public notices for use by the public water system.

This document is intended to assist public water systems in plan development efforts. Example plans, Assessment Forms and Seasonal Start up Procedures are included as appendices.

Special Purpose Samples

Special purpose samples are collected during repairs, in response to complaints, or for other maintenance reasons. Collection of these types of samples is necessary to ensure that coliform bacteria have not entered the distribution system as a result of events such as installation of mains, main line repair or routine maintenance. Special purpose samples cannot be included in compliance or assessment trigger calculations. Special purpose samples are collected in addition to any samples collected for compliance with the Revised Total Coliform Rule.

Seasonal System Requirements

A seasonal system is a non-community public water system that is not operated on a year round basis and starts up and shuts down at least a portion of the distribution system or otherwise discontinues water service to the public at the beginning and end of each operating season. The RTCR requires that non-community seasonal water systems demonstrate completion of a state-approved start up procedure including coliform sampling. A negative total coliform sample result must be obtained and certification of completion must be submitted to the state prior to serving water to the public. The initial total coliform sample is outside of and in addition to the routine sample requirements of the RTCR, and is considered a special purpose sample. A copy of the seasonal non-community public water system start up procedure and certification form is included as Appendix A. The start-up procedure should be conducted no more than 30 days prior to the start of the season.

Seasonal systems that have been approved to reduce monitoring to quarterly, must state in their sample siting plan the time period when they will take their routine sample. This period is based on site-specific conditions. Considerations for approval of this time period would include, when the demand for water is the highest, when the source water is most vulnerable to contamination (e.g., during the wet/dry season), or when there is a source of contamination that might affect the area surrounding the water source (e.g., spreading of animal waste for fertilizer). The Division must approve the sample siting plan for seasonal systems monitoring other than monthly and the system must monitor during the period identified in the approved sample siting plan. Otherwise all seasonal systems must begin monthly total coliform monitoring beginning April 01, 2016.

Recommended Sample Site Plan Outline

General Information/objective

Number of samples required

Site Selection

Distribution Map

Sampling procedures

Actions to be taken in the event of positive samples

- Repeat sampling requirements
- Ground Water Rule Source Samples if required
- Level 1 Assessments
    - Qualifications/ Forms/Corrective Actions
- Level 2 Assessments
    - Qualifications/Forms/Corrective Actions
- E. coli MCL Violation and public notice requirement
- Treatment Technique violations and public notice requirements
- Monitoring and Reporting Violations and public notice requirements

General System Information

General information should be included in the bacteriological sample siting plan to identify the public water system name and address, the Public Water Supply Identification Number (PWSID #), population served, the person responsible for the plan and date of last revision.

The official name and address for this system is

_____

_____

_____

The PWSID number for this system is
_____.

The population served by this system is _____.

The Person(s) responsible for reporting to the Division of Water resources and keeping the plan updated is _____.

Date of last plan update _____.

The objective of this plan is to identify routine and repeat bacteriological sampling locations, to ensure that the correct numbers of bacteriological samples are collected each monitoring period at sites which are representative of water throughout the distribution system and to ensure public water systems take appropriate follow up actions in response to positive bacteriological samples. The original siting plan should be kept on-site for use by sampling personnel.

Number of Samples Required

Routine Samples- General Monitoring Scheme

The frequency and number of routine samples required is specified in Rule 0400-45-01-.41(5)-(7) Systems must take at least the minimum number of required routine and repeat samples even if the system has had an E. coli MCL violation or has exceeded the coliform treatment technique trigger. System Specific Monitoring Requirements and general monitoring requirements are contained in Appendix B.

Non–Community NCWS using true ground water serving < 1000 Persons

Standard monitoring: one sample per quarter

In the event of a positive sample, three routine samples are required the following month.

Seasonal Non-Com Water Systems NCWS using true ground water serving <1000 Persons*

Standard monitoring: one sample each month the system is in operation
Reduced monitoring : one sample per quarter if criteria is met schedule approved.

Systems standard monitoring is one sample per month beginning April 1, 2016

Community Water Systems using true ground water and Serving <1000 Persons

Standard monitoring frequency: one sample per month

Community and Non-Community Subpart H (surface or GWUDI) Serving <1000 Persons*

Standard monitoring frequency: one sample per month

Community and Non-Community systems serving >1000 Persons *

Standard monitoring frequency: monthly based on population served as specified in Division Rule 0400-45-01-.41(7) (b.) Refer to Appendix B.

*Seasonal systems must complete start up procedure and certification and obtain a negative bacteriological result prior to start up.

Additional Routine Samples

A system may take more than the minimum number of required routine samples. If the system chooses to collect more than the minimum number of required samples, they must include the results in calculating whether the coliform treatment technique trigger has been exceeded, but only if the samples are taken in accordance with the existing sample siting plan and are representative of water throughout the distribution system. For example, a system that is required to collect 30 samples per monitoring period may elect to collect 40 samples but must identify that number of samples in the sampling plan.

Systems monitoring on a quarterly schedule are required to collect at least three routine samples the month following a positive sample result.

Repeat samples

If a routine bacteriological sample is total coliform-positive, the number of repeat samples required is three (3). A set of three (3) repeat samples will be collected for each positive sample. The repeat sampling procedure will continue until all samples are total coliform negative or a treatment technique trigger has been exceeded.

Repeat sampling locations

Systems must identify repeat monitoring locations in the sample siting plan. The system must collect at least one repeat sample from the sampling tap where the original total coliform-positive sample was taken, and at least one repeat sample at a tap within five service connections upstream and at least one repeat sample at a tap within five service connections downstream of the original sampling site. Only the addresses or locations of the routine sampling sites must be included in the plan. It is sufficient to note that repeat samples will be taken within 5 service connections upstream or 5 downstream service connections rather than give the actual address. If a total coliform-positive sample is at the end of the distribution system, or one service connection away from the end of the distribution system, the system must still take all required repeat samples. However, the State may allow an alternative sampling location in lieu of the requirement to collect at least one repeat sample upstream or downstream of the original sampling site.

Alternate Repeat Monitoring Locations

Systems may propose alternate repeat monitoring locations the system believes to be representative of a pathway for contamination of the distribution system. If a system chooses to have alternate repeat monitoring locations, the sampling plan must be approved by the Division of Water Resources prior to implementing the plan. A system may elect to specify either alternative fixed locations or criteria for selecting repeat sampling sites on a situational basis in a standard operating procedure (SOP) included in the sample siting plan. The system must design the SOP to focus the repeat samples at locations that best verify and determine the extent of

potential contamination of the distribution system area based on specific situations. The State may deny the proposal, modify the SOP or require alternative monitoring locations as needed. The use of alternate repeat monitoring locations will likely negate the possibility of sample invalidation due to domestic plumbing.

Selecting Sampling Sites

Monitoring required under the RTCR may take place at a customer's premise, dedicated sampling station, or other designated compliance sampling location. Routine and repeat sample sites and any sampling points necessary to meet the requirements of the RTCR and the Ground Water Rule (GWR) must be reflected in the sampling plan.

Systems monitoring quarterly should identify three additional sampling sites to be used in the event the system is triggered into increased monthly monitoring.

Systems should identify at least one backup or secondary sampling location for each designated sampling or pressure zone in the event that a site is unavailable for sampling.

Systems collecting more than one sample per month must collect samples at regular intervals throughout the month. Ground water systems serving 1,001 to 4,900 people may collect all required samples on a single day if they are taken from different sites.

Systems may generally follow the procedure below when selecting sampling sites

1. Coliform samples shall be collected at sites, which are representative of water throughout the distribution system according to the written sample-siting plan.
2. Samples are to be collected from a free flowing outlet of the ultimate user of the public water system, a dedicated sampling station or other designated compliance sampling location.
3. The goal should be to collect at least 30% of the required samples from residential areas. For the purposes of this plan, residential areas are defined as locations in the distribution systems which are served by the smallest distribution lines.
4. The system some of the required samples from dead end lines, low use areas, and areas near large storage tanks.
5. A map of the system with designated sampling zones and sampling site locations should be developed and included in the plan.

Other considerations in site selection when creating sample siting plans include:

- Pressure zones;
- Zones upstream and downstream of storage tanks with dedicated inflow and outflow lines (i.e., tanks that do not "float" on the distribution system);

- The location and type of water sources, treatment facilities, storage tanks, pressure stations, and service connections.
- The location of dead-end pipes, loops, and other areas of the piping system's configuration.
- Cross-connection hazards and shared connections.
- Areas of the distribution system delivering water from different sources;
- Areas of the distribution system with longer hydraulic retention times (if known)
- Areas of the distribution system with lower hydraulic pressures (if known).
- Areas of low water pressure and slow water movement.
- Varying population densities.

When appropriate, the system should be divided into zones, and site selection should be based on the criteria outlined above. Below is an example format that can be used.

The Public Water System will collect _____ routine samples per month. The System has been divided into _____ sampling/hydraulic/source zones. If a primary sampling site is not available, a secondary sampling site will be selected from the same zone for routine monitoring. Sampling will be conducted throughout the month with a goal of sample collection as follows.

_____ sample (s) is (are) to be taken from each sampling zone each month.

Samples will be collected throughout the month as follows.

First Week Number of Samples: _____ Zone(s)_____

Second Week Number of Samples: _____ Zone(s)_____

Third Week Number of Samples: _____ Zone(s)_____

*Fourth Week Number of Samples: _____ Zone(s)_____

*System may elect to collect all samples prior to the fourth week.

(All primary and alternative sites should be selected at least one to five taps from the end of a line to allow for proper repeat sampling)

Primary Routine Total Coliform Sampling Sites: (Should be equal to number of required monthly samples)

Map Site ID	Specific Addresses or GPS Coordinates	Zone	[1]Water Source

Alternative Routine Total Coliform Sampling Sites: (to be used if primary sites are not available or may be used in regular rotation)

Map Site ID	Specific Addresses or GPS Coordinates	Zone	[1]Water Source

[1]Any system subject to the Ground Water Rule or any system with multiple water sources or entry points must correlate each coliform sampling site with the applicable source of water or entry point. This designation and correlation is needed in the event a positive sample(s) trigger a ground water rule source sample or an RTCR assessment

If there is a total coliform or E. coli positive sample, three repeat samples will be collected within 24 hours of notification at the following locations:

- One sample at the site of the original positive sample.
- One sample at a site within five taps downstream of the original positive site.
- One sample at a site within five taps upstream of the original positive site.

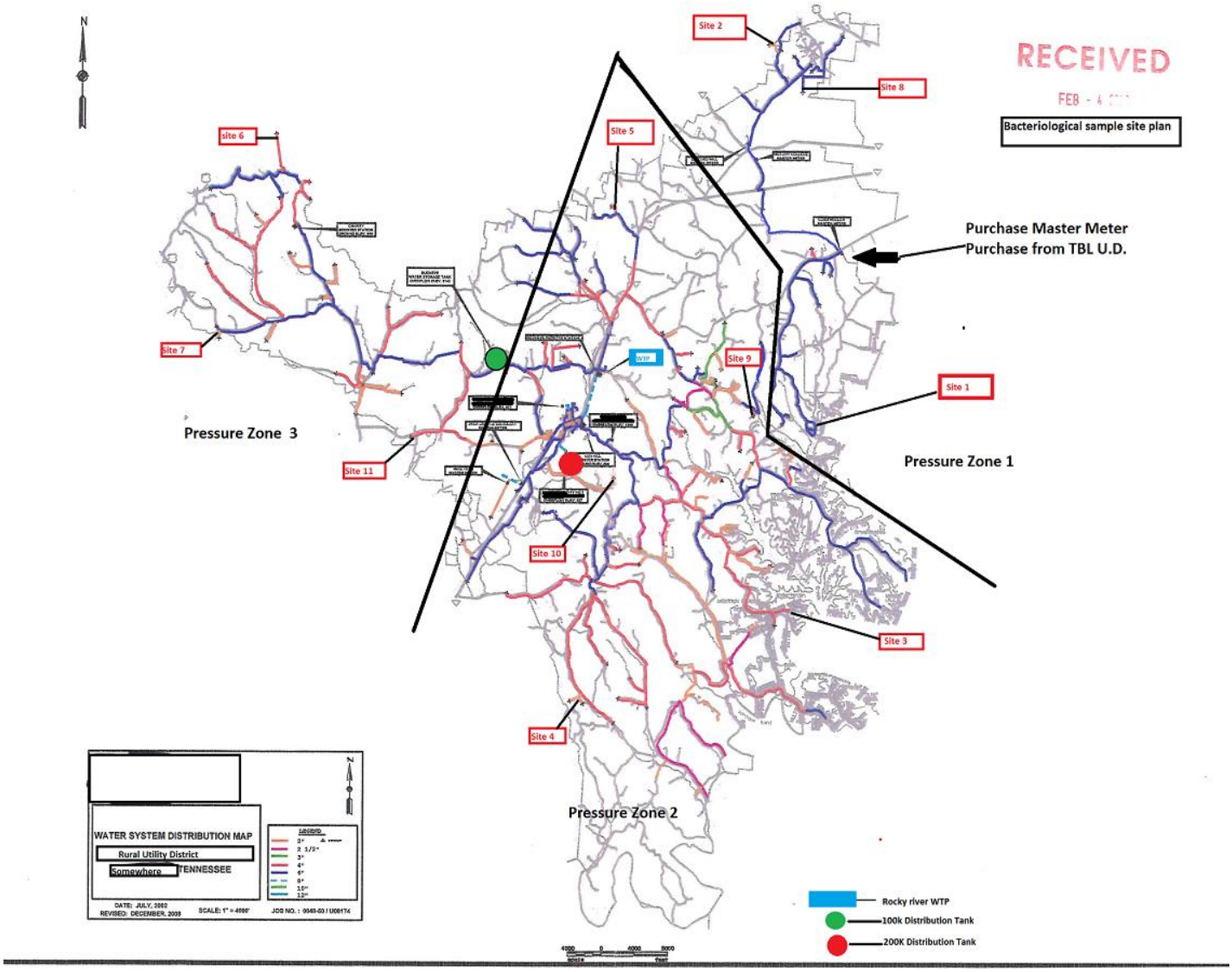
Systems monitoring on a quarterly schedule are required to collect at least three routine samples the month following a positive sample result. Additional monitoring sites should be identified for this purpose.

Seasonal systems that have been approved to reduce monitoring to quarterly, must state in their sample siting plan the time period when they will take their routine sample. Refer to page 3.

System Map

The plan must include a system map which demonstrates that samples site selection is representative of water throughout the system. The sample site locations, pressure or hydraulic zones, distribution storage tanks, and source water entry points must be designated.

Example Map of System



Sampling Procedure

1. Review the sample siting plan to determine where and when samples are to be taken.
2. After arriving at the sampling site, remove any attachments on the faucet.
3. Consider the use of a sodium hypochlorite spray solution or flaming to disinfect the faucet. Flaming should not be used on plastic faucets.
4. Turn the water on and let it run for several minutes or until water temperature stabilizes.
   - Flush out the customer lines, and
   - Ensure that the water being sampled is from the distribution lines, not the plumbing fixture. (A thermometer can be used to determine when water is being drawn from the distribution system and not the plumbing fixture. The water temperature will stabilize once all the water from the fixture has been flushed out and the water flowing from the faucet is coming from the distribution system.)
5. Adjust the flow from the faucet to a slow, steady stream.
6. Take a sample of water flowing from the tap and determine and document the free chlorine residual.
7. Open the laboratory supplied container used to take the bacteriological sample. Consider the use of latex gloves to minimize contamination risk.
8. Do not touch the inside of the bottle or lid.
9. Do not set the lid down.
10. Do not rinse the bottle out.
11. Grasp the container near the bottom and quickly place it under the flowing stream.
12. Fill the bottle to the neck or indicated fill line. Do not overfill. Collect at least 100 mL of water; this is the volume the laboratory must have for testing.
13. Remove the sample container from the flow as soon as it is filled. SEAL THE CONTAINER IMMEDIATELY.
14. Turn off the water and replace any fixtures or attachments that were removed previously.
15. Fill out the bacteriological sample slip. Instructions are included in Appendix E.
16. Place the container and completed forms in the shipping box.
17. Insure that the sample is delivered to the laboratory in a timely manner. Analysis must be initiated within 30 hours from the time sample is collected.
18. Record sampling event and information in the bacteriological sampling log. Refer to Appendix F.

Faucets to Avoid

Avoid taking samples at these faucets if at all possible.

- Unprotected Outdoor Faucets
- Frost-proof Faucets

If you cannot avoid these, be sure to use good sampling techniques. Avoid dust, obvious contamination, splashing rain, snow and other possible sources of contamination, such as:

- An indoor faucet connected to a pressure tank, or water heater.
- A new faucet.
- A hot water faucet.
- A recently repaired faucet.
- Faucets with threaded taps.
- Mixing faucets.
- Sites with a higher-than-usual possibility for bacterial contamination.
- Swing/swivel faucets.
- Faucets positioned close to a sink or the ground. (It must be high enough to keep it from touching the sampling container.
- Leaky faucets or faucets which allow water to seep around the valve stem.
- Faucets that supply areas, such as janitorial or commercial sinks, where bacterial contamination is likely.
- Faucets that have aerators. (If such faucets are to be used, the aerators should be removed before a sample is collected.)

What does this all mean? Avoid any faucet that will threaten to contaminate a sample. The idea is to sample the water in the distribution system, not necessarily the condition of the plumbing fixture. You may not always be able to avoid all these types of faucets. If you have to take a sample from one of these faucets, you should exercise extreme care and use good sampling techniques including spray disinfection or flaming of the faucet where appropriate.

Actions to be taken if a Sample is Total Coliform-Positive

Should one of the routine samples be total coliform-positive, public water systems are required to take a set of three (3) repeat samples for each total coliform positive sample result. Each set of repeat samples will be taken as follows:

- at least one of the repeat samples must be taken from the sampling tap where the original total coliform-positive samples was taken;
- at least one of the repeat samples must be taken at a tap within 5 service connections downstream from the original sampling site;
- at least one of the repeat samples must be taken at a tap within 5 service connections upstream from the original sampling site;
- the complete set of repeat samples must be taken within 24 hours of the system being notified of a positive coliform result, or when instructed to sample by the Division of Water Resources;
- the entire set of repeat samples must be taken on the same day.
- alternate repeat sample locations are allowed but only if the locations and or SOP for determining locations has been included as part of the sampling plan and has been approved by the Division of Water Resources

Repeat samples must be taken for each positive result until:

- total coliforms are not detected in one complete set of repeat samples, or
- the system exceeds the total coliform treatment technique trigger during the month and notifies the State Department of Environment and Conservation, Division of Water Resources.
- If a total coliform-positive sample is at the end of the distribution system, or one service connection away from the end of the distribution system, the system must still take all required repeat samples. However, the State may allow an alternative sampling location in lieu of the requirement to collect at least one repeat sample upstream or downstream of the original sampling site. The State will be contacted in the event this scenario occurs.

Systems on a quarterly monitoring schedule are required to collect three additional routine samples the month following a total coliform positive sample result.

Systems subject to the ground water rule source water monitoring requirements (do not provide 4 log virus removal) must also collect a source water sample within 24 hours.

Sampling During Weekends and Holidays

Should repeat samples be required on a weekend or holiday, follow this procedure:

Routine should be taken on Mondays and Tuesdays to avoid a problem with repeat samples. This should allow ample time for repeat samples to be collected before the weekend if they are required. If a holiday should occur, which could cause a problem with either routine or repeat sampling being submitted to the state laboratory, samples must be taken to a private certified laboratory for analysis. Planning ahead, and following these guidelines, should avoid any sampling problems associated with weekends or holidays.

Should it not be possible to collect repeat samples and submit them for analysis within the required 24-hour period because of a holiday or weekend, the system will provide for a "boil water notice" to be issued until sufficient samples can be collected and analyzed to verify that the contamination has been eliminated. Refer to page 18 for an example of a "boil water notice".

Treatment Technique Triggers and Assessments

Level 1 Assessments

A level 1 assessment is required to be conducted as soon as practical but no later than 30 days of the following events. A Division of Water Resources Level 1 Assessment form must be completed and submitted to the Division of Water Resources. Refer to Appendix C for Level 1 Assessment forms.

- For systems, which take less than 40 samples during a month**,** the system has exceeded the Level 1 treatment technique trigger if the system has more than one total coliform-positive sample, including repeat samples during a month.

- For systems, which take 40 or more samples during a month, the system exceeded the Level 1 treatment technique trigger if the number of total coliform positive samples, including repeats, exceeds 5.0% of the samples collected during a month.

- The system fails to collect every required repeat sample after any single total coliform positive sample.

- Level 1 assessments for a CWS must be conducted by a licensed certified operator. Level 1 assessments for a NCWS may be conducted by a system owner or operator. A State approved Level 1 Assessment form must be completed and submitted to the Division of Water Resources within 30 days of the trigger exceedance. Any sanitary defects or deficiencies must be corrected within 30 days of the trigger exceedance or in accordance with an approved schedule from the Division of Water Resources.

Level 2 Assessments

A level 2 assessment is required to be conducted as soon as practical but no later than 30 days of any of the following events. Refer to Appendix D for Level 2 Assessment forms.

- An E. coli Maximum Contaminant Level (MCL) violation
- A second Level 1 assessment trigger within a rolling 12 month period.
- Level 2 assessments for all systems must be conducted by a certified operator licensed to at least the same level as the public water system being assessed and who has completed an approved level 2 training course from the Division of Water Resources or by a Division of Water Resources staff member. A system serving a population of less than 50,000 must use a 3rd party assessor. A Division of Water Resources Level 2 Assessment form must be completed and submitted to the Division of Water Resources within 30 days of the trigger exceedance. Any sanitary defects or deficiencies must be corrected within 30 days of the trigger exceedance or in accordance with an approved schedule from the Division of Water Resources.

E. coli Maximum Contaminant Level (MCL) Violations

An E. coli MCL violation occurs when any of the following conditions exist.

- An E. coli positive repeat sample follows a Total Coliform positive routine sample.
- A Total Coliform positive repeat sample follows an E. coli positive routine sample.
- A system fails to take all required repeat samples (3) following an E. coli positive routine sample.
- A system fails to test for E. coli when any repeat sample tests positive for total coliform.

Actions to be taken if an E. coli-Positive Sample is involved in the Violation (A Violation Requiring a Tier 1 Public Notification)

If any repeat sample is E. coli -positive or any repeat sample following an E. coli-positive routine sample is total coliform-positive:

- Report the violation to the State no later than the end of the day when the system was notified of the results, unless the system is notified after the Department office is closed, in which case it must notify the State before the end of the next business day.
  Person to Contact: _____ at the _____ Environmental Field Office
  Telephone: _____ or 1-888-891-8332
- Notify the public using this procedure:
  - Furnish a copy of the notice to customers by direct delivery and or to the local radio and television stations served by the public water system as soon as possible, **but no later than 24 hours after the violation;**
- Refer to the EPA Public Notification Handbook for specific content and delivery requirements. An example is contained on following page.

    - The notice should contain the language shown in the example notice on the following page;
    - The system may want to describe what is being done to correct the problem:
      - Total number of samples taken,
      - Total number of positive samples,
      - Problem areas,
      - Mains are being flushed, etc.
- A Level Two Assessment must be conducted within 30 days of the E. coli positive sample. This assessment must be conducted by personnel approved by the Division of Water Resources.

Example Tier 1 PN for Violating the *E. coli* MCL

DRINKING WATER WARNING

E. coli is Present in System A's Water

BOIL YOUR WATER BEFORE DRINKING OR USING

Our water system detected *E. coli* bacteria in our distribution system. As our customers, you have a right to know what happened and what we are doing to correct this situation. On April 4, 2016, we learned that coliform bacteria were present and one of our routine samples collected on April 2, 2016, was total coliform-positive (TC+). As required by the Revised Total Coliform Rule, one of our follow-up steps was to collect repeat samples at and near the location where the TC+ sample was originally taken. One of these repeat samples collected on April 5 tested positive for *E. coli*. We are now conducting additional sampling to determine the extent of the problem and are conducting a thorough investigation to determine the source of the contamination.

What should I do?

DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST. Bring all water to a rolling boil, let it boil for one minute, and let it cool before using it. Boiling kills bacteria and other organisms in the water. You may also use bottled water. Use boiled or bottled water for drinking, making ice, preparing food and washing dishes until further notice.

Also, if you have a severely compromised immune system, have an infant, or are elderly, you may be at increased risk and should seek advice about drinking water from your health care providers. General guidelines on ways to lessen the risk of infection by microbes are available from EPA's Safe Drinking Water Hotline at (800) 426-4791. If you have specific health concerns, consult your doctor. We are also providing regular updates on this situation on Channel 22 or Radio Station KMMM (97.3 FM).

What does this mean?

Inadequately treated or inadequately protected water may contain disease-causing organisms. These organisms can cause symptoms such as diarrhea, nausea, cramps and associated headaches. *E. coli are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, some of the elderly, and people with severely-compromised immune systems.* These symptoms are not caused only by organisms in drinking water. If you experience any of these symptoms and they persist, you may want to seek medical advice.

What is being done?

We are conducting a thorough investigation to determine the source of the contamination and will be working with the State to implement corrective actions to ensure that our water supplies are protected against contamination. We will keep you informed of the steps we are taking to protect your drinking water and will provide information on any steps you should be taking. We will inform you when tests show no bacteria and you no longer need to boil your water. We are also providing regular updates on this situation on Channel 22 or Radio Station KMMM (97.3 FM).

For more information, please contact John Johnson, manager of System A, at (555) 555-1234 or write to 2600 Winding Rd., Townsville, TM 12345.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by System A. State Water System ID# TN 1234582. Sent: 4/7/15

Treatment Technique Violations

A treatment technique violation occurs when any of the following conditions occur.

- A system exceeds a treatment technique trigger and then fails to conduct an assessment or complete corrective actions within required timeframes.

- A seasonal system fails to complete a Department-approved start up procedure prior to serving water to the public.

Actions to be taken in the event of a Treatment Technique Violation (A Violation Requiring a Tier 2 Public Notification)

A public water system that has violated the treatment technique for total coliforms by failing to conduct an assessment, complete corrective actions or fails to complete the approved seasonal start up procedure must;

- Report the violation to the State no later than the end of the next business day after system learns of the violation.
  Person to Contact: _____ at the _____ Environmental Field Office
  Telephone: _____ or 1-888-891-8332
- A Tier 2 Public Notice must be issued:
  Tier 2 notices must be issued within 30 days of learning of the violation.
- Refer to the EPA Public Notification Handbook for specific content and delivery requirements. Examples are contained in the next three pages

- Notify the public using this procedure:
  - Furnish a copy of the notice to the customers served by the public water system via mail or other direct delivery as soon as possible, **but no later than 30 days after the violation;**
    - The notice should contain the language shown in the example notices on the next pages;
    - The system may want to describe what is being done to correct the problem:

Example of a Tier 2 PN for Failure to Perform a Level 1 or 2 Assessment

DRINKING WATER NOTICE

System B Failed to Conduct an Assessment of the Facility and Distribution System

Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the distribution system. In one sample we collected on June 12, 2016, and one sample collected on June 16, 2016, we found coliforms, indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct an assessment to identify problems and to correct any problems that are found. We were required to conduct a Level 1 assessment within 30 days of learning of the second total coliform-positive (TC+) sample. A Level 1 assessment is a study of the water system to identify potential problems and determine (if possible) why total coliform bacteria have been found in our water system. As our customers, you have a right to know what happened and what we are doing to correct this situation. As required by the Revised Total Coliform Rule, *we failed to conduct the required Level 1 or 2 assessment* within 30 days, and have therefore, violated a requirement of the Revised Total Coliform Rule.

What does this mean?

This is not an emergency. If it had been an emergency, you would have been notified within 24 hours.

Failure to conduct an assessment to identify the sanitary defect that triggered the assessment has the potential to cause distribution system contamination. *Inadequately treated or inadequately protected water may contain disease-causing organisms. These organisms can cause symptoms such as diarrhea, nausea, cramps, and associated headaches.* Failure to perform the assessment prolonged the risk of fecal contamination of our distribution system water. While we have not detected any evidence of fecal contamination in our distribution system, we are committed to correcting the deficiency to eliminate the potential threat of contamination.

What should I do?

You do not need to boil your water or take other corrective actions. However, if you have specific health concerns, consult your doctor.

If you have a severely compromised immune system, have an infant, are pregnant, or are elderly, you may be at increased risk and should seek advice from their health care providers about drinking this water. General guidelines on ways to lessen the risk of infection by microbes are available from EPA's Safe Drinking Water Hotline at (800) 426-4791.

You do not need to boil your water or take other corrective actions. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will announce any emergencies on Channel 22 or Radio Station KMMM (97.3 FM).

What is being done?

We have since completed the Level 1 assessment and identified the cause of the sanitary defect; damage to the storage tank. We are implementing the corrective action plan established by the State. Under this plan, the damage will be repaired and the tank will be disinfected by August 31, 2016.

For more information, please contact John Johnson, manager of System B, at (555) 555-1234 or write to 2600 Winding Rd., Townsville, TM 12345.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being posted by System B. State Water System ID# TN 1234583. Sent: 8/10/2016

Example of a Tier 2 PN for Failure to Perform Corrective Action
DRINKING WATER NOTICE
System B Failed to Perform Corrective Action Following an Assessment of the Facility and Distribution System

Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the distribution system. We found coliforms, indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessment(s) to identify problems and to correct any problems that are found. This past summer, we were required to conduct a Level 1 assessment. We completed the required Level 1 assessment and identified the cause of the sanitary defect to be damage to the storage tank. *While we failed to correct the sanitary defect within the required timeframe,* we are implementing the corrective action plan established by the State. As our customers, you have a right to know what happened and what we are doing to correct this situation. As required by the Revised Total Coliform Rule, we failed to complete the corrective action within the required timeframe, and have therefore, violated a requirement of the Revised Total Coliform Rule.

What does this mean?
This is not an emergency. If it had been an emergency, you would have been notified within 24 hours.
Failure to correct the identified defect that was found during the assessment has the potential to cause distribution system contamination. *Inadequately treated or inadequately protected water may contain disease-causing organisms. These organisms can cause symptoms such as diarrhea, nausea, cramps, and associated headaches.*

What should I do?
- You do not need to boil your water or take other corrective actions. However, if you have specific health concerns, consult your doctor.
- If you have a severely compromised immune system, have an infant, are pregnant, or are elderly, you may be at increased risk and should seek advice from their health care providers about drinking this water. General guidelines on ways to lessen the risk of infection by microbes are available from EPA's Safe Drinking Water Hotline at (800) 426-4791.

You do not need to boil your water or take other corrective actions. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will announce any emergencies on Channel 22 or Radio Station KMMM (97.3 FM).

What is being done?
Since being informed of the failure, we have begun to correct the sanitary defect identified during the Level 1 assessment. During the assessment, the sanitary defect was determined to be damage to the storage tank. We are in communication with the State and have modified the corrective action plan's schedule to repair and disinfect the storage tank.

For more information, please contact John Johnson, manager of System B, at (555) 555-1234 or write to 2600 Winding Rd., Townsville, TM 12345.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.
This notice is being posted by System B. State Water System ID# TN1234583. Sent: 9/20/2016

Example of a Tier 2 PN for Failure of a Non-community Seasonal System to Perform State-Approved Start-up Procedures Prior to Serving Water to the Public

DRINKING WATER NOTICE

System E Failed to Perform State-Approved Start-up Procedures Prior to Serving Water to the Public

Prior to serving water to the public in October, we failed to perform the state-approved start-up procedures for our water system. As our customers, you have a right to know what happened and what we are doing to correct this situation. Because we failed to implement these procedures, we have violated a requirement of the Revised Total Coliform Rule.

What does this mean?

This is not an emergency. If it had been an emergency, you would have been notified within 24 hours. Failure to perform state-approved start-up procedures prior to serving water to the public has the potential to cause source water contamination. *Inadequately treated or inadequately protected water may contain disease-causing organisms. These organisms can cause symptoms such as diarrhea, nausea, cramps, and associated headaches.* Failure to perform the start-up procedures prolonged the risk of fecal contamination of our source water. While we have not detected any evidence of fecal contamination in our source water, we are committed to correcting the deficiency to eliminate the threat of contamination.

What should I do?

- If you have specific health concerns, consult your doctor.
- If you have a severely compromised immune system, have an infant, are pregnant, or are elderly, you may be at increased risk and should seek advice from their health care providers about drinking this water. General guidelines on ways to lessen the risk of infection by microbes are available from EPA's Safe Drinking Water Hotline at (800) 426-4791.

What is being done?

Since being informed of the failure, we have completed the required start-up procedures and have provided certification to the state. We have also collected three coliform samples and all three samples were coliform-negative.

If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours.

For more information, please contact John Johnson, manager of System E, at (555) 555-1234 or write to 2600 Winding Rd., Townsville, TM 12345.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly. You can do this by posting this notice in a public place.

This notice is being posted by System E. State Water System ID# TN1234583. Sent: 11/27/2016

Monitoring and Reporting Violations

A Monitoring or Reporting violation occurs when any of the following conditions exist.

- A system fails to collect all routine or additional routine samples
- A system fails to take/analyze for E. coli after a total coliform positive routine.
- A system fails to submit a monitoring report, assessment report or certification of start-up procedure completion.
- A system fails to notify the State of an E. coli positive sample.

Actions to be taken in the event of a Monitoring/ Reporting Violation (A Violation Requiring a Tier 3 Public Notification)

A public water system that has violated the Monitoring and or Reporting requirements must;

- Report the violation to the State no later than the end of the next business day after system learns of the violation.
  Person to Contact: _____ at the _____ Environmental Field Office
  Telephone: _____ or 1-888-891-8332
- A Tier 3 Public Notice must be provided to customers:
  Tier 3 notices must be issued within 365 days of learning of the violation.
- Refer to the EPA Public Notification Handbook for specific content and delivery requirements. Examples are contained in the next two pages
- Notify the public using this procedure:
  - Furnish a copy of the notice to the customers served by the public water system via mail or other direct delivery as soon as possible, **but no later than 365 days after the violation;**
    - The notice should contain the language shown in the example notices on the next pages;
    - The system may want to describe what is being done to correct the problem:

Example Tier 3 PN for Failure to Take All Routine Total Coliform Samples in the Required Compliance Period

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER
Monitoring Requirements Not Met for System D

We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards. During December 2016, we did not complete all monitoring or testing for total coliform, and therefore, cannot be sure of the quality of your drinking water during that time.

On January 11, 2017, we became aware that our water system failed to collect all of the required monthly routine total coliform distribution system samples in December 2016. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we did to correct the situation. None of the 12 samples that we did collect was positive for total coliform or *E. coli* bacteria.

What should I do?
There is nothing you need to do. You do not need to boil your water or take other corrective actions. You may continue to drink the water. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will also announce any emergencies on Channel 22 and Radio Station KMMM (97.3 FM).

What was done?
We collected all 15 of the required routine total coliform samples in January and tested them for *E. coli*. None of the samples collected in January was positive for *E. coli*.

For more information, please contact John Johnson, manager of System D, at (555) 555-1234 or write to 2600 Winding Rd., Townsville, TM 12345.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by System D. State Water System ID# TM1234585. Sent: 1/10/2018

Example Tier 3 PN for Failure to Notify the State Following an *EC+* Sample Result

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER
Reporting Requirements Not Met for System F

Our system failed to notify the state of an *E. coli*-positive (*EC+*) routine sample by the end of the day that we learned of the violation. The water system has not exceeded the *E. coli* MCL standard set by the Revised Total Coliform Rule. Although this incident was not an emergency, as our customers, you have a right to know what happened and what we did to correct the situation.

What should I do?
There is nothing you need to do. You do not need to boil your water or take other corrective actions. You may continue to drink the water. If a situation arises where the water is no longer safe to drink, you will be notified within 24 hours. We will also announce any emergencies on Channel 22 and Radio Station KMMM (97.3 FM).

What was done?
We notified the state of the routine monitoring sample that was *EC+*.

For more information, please contact John Johnson, manager of System F, at (555) 555-1234 or write to 2600 Winding Rd., Townsville, TM 12345.

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

This notice is being sent to you by System F. State Water System ID# TN1234585. Sent: 3/11/2017